

Claims:

1. A process for making a pigmented vitreous material from a liquid or dissolved transition metal compound, wherein the liquid or dissolved transition metal compound reacts to form crosslinks between the liquid or dissolved transition metal atoms in the pigmented vitreous material, characterized in that the solution also comprises a dissolved compound of the formula



in which x is an integer from 1 to 8,

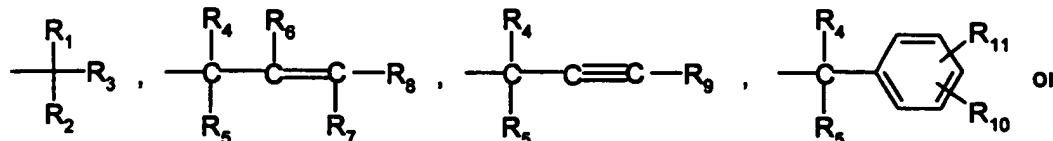
A is the radical of a chromophor of the quinacridone, anthraquinone, perylene, indigo, quinophthalone, indanthrone, isoindolinone, isoindoline, dioxazine, azo, phthalocyanine, diketopyrrolopyrrole or 3-methylidene-2,3-dihydro-indol-2-on series which is attached to x groups B via one or more heteroatoms selected from the group consisting of N, O and S and forming part of the radical A,

B is hydrogen or a group of the formula $\text{---}\overset{\text{O}}{\parallel}\text{---O---L}$, where at least one group B is not hydrogen and, if x is from 2 to 8, the groups B can be identical or different, and

L is any suitable solubilizing group,

and the vitreous material is heated so that the compound of the formula (I) is transformed into a pigment of the formula $A(H)_x$ (II), in which x has the same meaning as in formula (I).

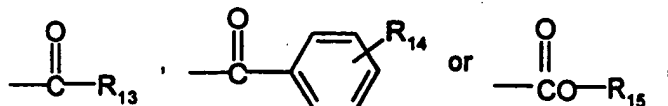
2. A process according to claim 1, wherein ---L is a group of the formula



R_4 and R_5 independently of one another are $C_1\text{--}C_8\text{alkyl}$, O, S or $N(R_{12})_2$ interrupt of $C_1\text{--}C_8\text{alkyl}$, unsubstituted or $C_1\text{--}C_8\text{alkyl-}$, $C_1\text{--}C_8\text{alkoxy-}$, halo-, cyano- or nitro-substituted phenyl or biphenyl,

R_6 , R_7 and R_8 independently of one another are hydrogen or C_1 - C_6 alkyl,

R_9 is hydrogen, C_1 - C_6 alkyl or a group of the formula



R_{11} and R_{10} independently of one another are hydrogen, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, halogen, cyano, nitro, $N(R_{12})_2$, unsubstituted or halo-, cyano-, nitro-, C_1 - C_6 alkyl- or C_1 - C_6 alkoxy-substituted phenyl,

R_{12} and R_{13} are C_1 - C_6 alkyl, R_{14} is hydrogen or C_1 - C_6 alkyl and R_{15} is hydrogen, C_1 - C_6 alkyl, unsubstituted or C_1 - C_6 alkyl-substituted phenyl,

Q is p,q- C_2 - C_6 alkylene which is unsubstituted or substituted one or more times by C_1 - C_6 alkoxy, C_1 - C_6 alkylthio or C_2 - C_{12} dialkylamino, p and q being different numeric locants,

X is a heteroatom selected from the group consisting of N, O and S, where m is 0 if X is O or S and is 1 if X is N, and

L_1 and L_2 independently of one another are unsubstituted or mono- or poly- C_1 - C_{12} alkoxy-, $-C_1$ - C_{12} alkylthio-, $-C_2$ - C_{24} dialkylamino-, $-C_6$ - C_{12} aryloxy-, $-C_6$ - C_{12} arylthio-, $-C_7$ - C_{24} alkylaryl amino- or $-C_{12}$ - C_{24} diaryl amino-substituted C_1 - C_6 alkyl or $[(p',q'-C_2-C_6\text{alkylene})-Z]_n-C_1-C_6\text{alkyl}$, where n is a number from 1 to 1000, p' and q' are different numeric locants, each Z independently of the others is a heteroatom O, S or C_1 - C_{12} alkyl-substituted N, and C_2 - C_6 alkylene in the repeating units $[-C_2-C_6\text{alkylene}-Z-]$ can be identical or different,

and L_1 and L_2 can be saturated or mono- to deca-unsaturated, uninterrupted or interrupted in any desired points by from 1 to 10 groups selected from the group consisting of $-(C=O)-$ and $-C_6H_4-$, and may carry no or 1 to 10 further substituents selected from the group consisting of halogen, cyano and nitro.

3. A process according to claim 1, wherein the pigment of the formula $A(H)_x$ (II) is Colour Index Pigment Yellow 13, Pigment Yellow 73, Pigment Yellow 74, Pigment Yellow 83, Pigment Yellow 93, Pigment Yellow 94, Pigment Yellow 95, Pigment Yellow 109, Pigment

Yellow 110, Pigment Yellow 120, Pigment Yellow 128, Pigment Yellow 139, Pigment Yellow 151, Pigment Yellow 154, Pigment Yellow 175, Pigment Yellow 180, Pigment Yellow 181, Pigment Yellow 185, Pigment Yellow 194, Pigment Orange 31, Pigment Orange 71, Pigment Orange 73, Pigment Red 122, Pigment Red 144, Pigment Red 166, Pigment Red 184, Pigment Red 185, Pigment Red 202, Pigment Red 214, Pigment Red 220, Pigment Red 221, Pigment Red 222, Pigment Red 242, Pigment Red 248, Pigment Red 254, Pigment Red 255, Pigment Red 262, Pigment Red 264, Pigment Brown 23, Pigment Brown 41, Pigment Brown 42, Pigment Blue 25, Pigment Blue 26, Pigment Blue 60, Pigment Blue 64, Pigment Violet 19, Pigment Violet 29, Pigment Violet 32, Pigment Violet 37, 3,6-di(4'-cyano-phenyl)-2,5-dihydro-pyrrolo[3,4-c]pyrrole-1,4-dione or 3-phenyl-6-(4'-tert-butyl-phenyl)-2,5-dihydro-pyrrolo[3,4-c]pyrrole-1,4-dione.

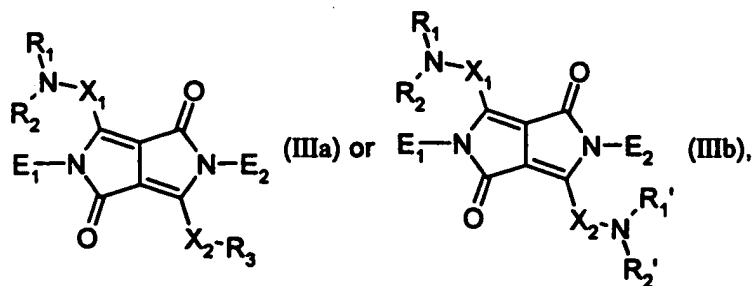
4. A process according to claim 1, wherein the liquid or dissolved transition metal compound is shaped into a coating from which a from 0.1 to 3 μm thick film of pigmented vitreous material results upon the formation of crosslinks and the transformation of (I) to (II).

5. A process according to claim 1, additionally comprising adding a compound of structure $\text{HO}-\text{Q}-\text{X}-\text{L}_2$ and then heating to a temperature from 150 to 300°C to form the vitreous material.

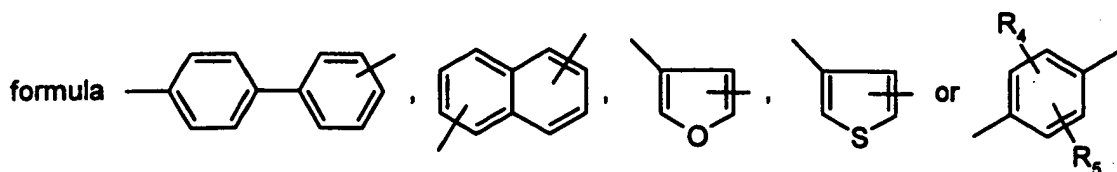
6. A process according to claim 5, wherein A is quinacridone radical, L is ---Q-X-L_2 , and the pigment of the formula A(H)_x (II) is a β crystal phase quinacridone.

7. A process according to claim 1, comprising from 2 to 10 organic pigments of the formula A(H)_x (II).

8. A 2,5-dihydro-pyrrolo[3,4-c]pyrrole-1,4-dione of the formula



in which X_1 and X_2 independently of one another are a divalent aromatic radical of the



R_3 is a radical CN, COR_6 , CO_2R_6 , $CON(R_6)_2$, NO_2 , SO_2R_6 , SOR_6 , $SO_2N(R_6)_2$ or $PO(OR_7)_2$.

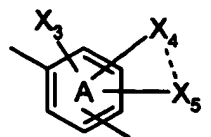
R_4 and R_5 independently of one another are hydrogen, chlorine, bromine, methyl, ethyl, methoxy or ethoxy,

R_7 is C_1 - C_6 alkyl or phenyl,

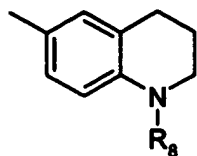
R_1 , R_2 , R_1' , R_2' and R_6 independently of one another are hydrogen, C_1 - C_{18} alkyl or C_1 - C_{18} alkenyl which is unsubstituted or substituted by hydroxy, mercapto, C_1 - C_6 alkoxy or C_1 - C_6 alkylmercapto, or phenyl which is unsubstituted or substituted by chlorine, bromine, hydroxy, C_1 - C_6 alkyl, C_1 - C_6 alkoxy, C_1 - C_6 alkylmercapto, CN, NO_2 or CF_3 ,

or R_1 and R_2 or R_1' and R_2' , together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocyclic radical which is unsubstituted or substituted by C_1 - C_6 alkyl or phenyl and is selected from the group consisting of pyrrolidinyl, piperidyl, pyrrolyl, triazolyl, imidazolyl, pyrazolyl, piperazinyl, morpholinyl, thiomorpholinyl, carbazol-1-yl, indol-1-yl, indazol-1-yl, benzimidazol-1-yl, tetrahydroquinol-1-yl and tetrahydroquinol-2-yl, or,

if R_1 or R_1' is hydrogen, R_2 or R_2' is a radical of the formula

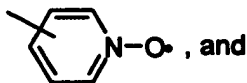


in which X_3 and X_4 independently of one another are hydrogen, chlorine, bromine, NO_2 , methyl, methoxy or ethoxy and X_5 and X_6 form a 5- or 6-membered heterocyclic ring which together with A produces a benzimidazolonyl, dihydroxyquinazolinyl, quinolonyl, benzoxazolonyl, phenmorpholonyl, quinazolinonyl or phthalimidyl radical or a radical of the formula



, in which R_8 is C_1 - C_6 alkyl or phenyl,

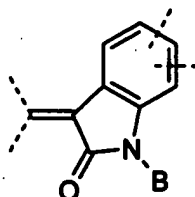
or X_2 - R_3 can be a radical



E_1 is hydrogen and E_2 is a group B, E_1 is a group B and E_2 is hydrogen, or E_1 and E_2 are both a group B,

with the proviso that when said 2,5-dihydro-pyrrolo[3,4-c]pyrrole-1,4-dione is of formula (IIIb), R_1 is not C_1 - C_{18} alkylamino.

9. A compound having at least one



moiety in its structure, wherein B is a

group as defined in claim 1.

10. A composition for making a vitreous material comprising a crosslinkable liquid or dissolved transition metal compound and a dissolved compound of the formula $A(B)_x$ (I) as defined in claim 1.

11. A vitreous material comprising a matrix of crosslinked liquid or dissolved transition metal atoms and an effective pigmenting amount of a pigment selected from from Colour Index Pigment Yellow 13, Pigment Yellow 73, Pigment Yellow 74, Pigment Yellow 93, Pigment Yellow 94, Pigment Yellow 95, Pigment Yellow 109, Pigment Yellow 120, Pigment Yellow 128, Pigment Yellow 139, Pigment Yellow 151, Pigment Yellow 154, Pigment Yellow 175, Pigment Yellow 180, Pigment Yellow 181, Pigment Yellow 185, Pigment Yellow 194, Pigment Orange 31, Pigment Orange 71, Pigment Orange 73, Pigment Red 144, Pigment Red 166, Pigment Red 184, Pigment Red 185, Pigment Red 202, Pigment Red 214, Pigment Red 220, Pigment Red 221, Pigment Red 222, Pigment Red 242, Pigment Red 248, Pigment Red 255, Pigment Red 262, Pigment Red 264, Pigment Brown 23, Pigment Brown 41, Pigment Brown 42, Pigment Blue 25, Pigment Blue 26, Pigment Blue 60, Pigment Blue 64, Pigment Violet 29, Pigment Violet 32, Pigment Violet 37, 3,6-di(4'-cyano-phenyl)-2,5-dihydro-pyrrolo[3,4-c]pyrrole-1,4-dione or 3-phenyl-6-(4'-tert-butyl-phenyl)-2,5-dihydro-pyrrolo[3,4-c]pyrrole-1,4-dione.

12. A vitreous material of claim 11, which is in the form of a from 0.1 to 3 μm thick film.

13. A glass item coated with a vitreous material of claim 11 or 12, which item is preferably a bottle or a display screen.